

GOVDOC

B124

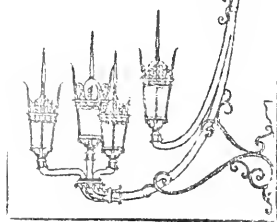
3272

BOSTON PUBLIC LIBRARY



3 9999 06583 438 2

BOSTON
PUBLIC
LIBRARY



Digitized by the Internet Archive
in 2010 with funding from
Boston Public Library

<http://www.archive.org/details/bostonregionalsu00mass>

00091
00938

MASS TRANSPORTATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

GOV DOC

B.R.A

3272

BOSTON PUBLIC LIBRARY



BOSTON REGIONAL SURVEY

LAND USE

2

20

THE PLANNING SERVICES GROUP
CONSULTANTS

THE BOSTON REGIONAL SURVEY

"BOSTON PUBLIC LIBRARY"

OVERVIEW : CHAPTER TWO

REGIONAL LAND USE PATTERNS

JUNE, 1962

Prepared for the
MASS TRANSPORTATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

120 Tremont Street
Boston, Massachusetts

by

THE PLANNING SERVICES GROUP
Cambridge, Massachusetts

The preparation of this memorandum has been financed in part through an urban planning assistance grant from the U. S. Housing and Home Finance Agency under the provisions of Section 701 of the Housing Act of 1954, as amended.

MASS TRANSPORTATION COMMISSION

COMMONWEALTH OF MASSACHUSETTS

Daniel Tyler Jr., Chairman, Metropolitan Transit Authority

Ephraim A. Brest, Chairman, Massachusetts Port Authority

William F. Callahan, Chairman, Massachusetts Turnpike Authority

Thomas F. Carty, Commissioner, Boston Traffic Commission

Robert F. Murphy, Commissioner, Metropolitan District Commission

Jack P. Ricciardi, Commissioner, Department of Public Works

Miss Lucy Carra

Robert G. Henderson

Joseph Dragone

Harold Finn

Michael J. Gormley

EXECUTIVE DIRECTOR

Dr. Joseph F. Maloney

MASS TRANSPORTATION COMMISSION

COMMONWEALTH OF MASSACHUSETTS

Daniel Tyler Jr., Chairman, Metropolitan Transit Authority

Ephraim A. Brest, Chairman, Massachusetts Port Authority

William F. Callahan, Chairman, Massachusetts Turnpike Authority

Thomas F. Carty, Commissioner, Boston Traffic Commission

Robert F. Murphy, Commissioner, Metropolitan District Commission

Jack P. Ricciardi, Commissioner, Department of Public Works

Miss Lucy Carra

Robert G. Henderson

Joseph Dragone

Harold Finn

Michael J. Gormley

EXECUTIVE DIRECTOR

Dr. Joseph F. Maloney

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
1. THE SPREAD OF URBAN DEVELOPMENT	5
Physical Determinants of Land Use	5
Multiple Nuclei of Development	8
Patterns of Growth	8
Transportation Factors	12
2. THE EXISTING LAND USE PATTERN	15
Principal Features of the Land Use Pattern	20
Characteristics of Major Land Use Categories	21
Residential Land Use	21
Residential Construction Patterns	22
The Need for Residential Renewal	27
Commercial Land Use	30
Industrial Land Use	34
Recreational Land Use	38
3. FUTURE PATTERNS OF REGIONAL DEVELOPMENT	42
The Consumption of Regional Land	42
The Role of Agriculture	45
The Effect of Zoning	46
Future Patterns of Growth	51
APPENDIX A - SOURCES OF DATA	53



LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	INTENSITY OF LAND USE IN SUB-AREAS OF THE GBESC STUDY AREA, 1960	11
2	LAND USE IN SUB-AREAS OF THE GBESC STUDY AREA, 1960	17
3	LAND USE IN GREATER BOSTON: NUMBER OF ACRES DEVOTED TO RESIDENTIAL, COMMERCIAL AND INDUSTRIAL USES BY BOSTON REGIONAL SURVEY SECTORS AND ZONES, 1960	18
4	DISTRIBUTION OF BUILDING PERMITS ISSUED IN THE BOSTON METROPOLITAN REGION IN 1950 and 1960	25
5	SUBSTANDARD HOUSING IN THE BOSTON METROPOLITAN REGION AND SELECTED AREAS, 1960	29
6	RETAIL FLOOR SPACE IN THE BOSTON AREA, 1962	33
7	ZONING OF OPEN LAND IN SUB-AREAS OF THE GBESC STUDY AREA, 1960	50

LIST OF ILLUSTRATIONS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1	NORTHEASTERN URBAN AREAS, 1960	3
2	SECTOR AND ZONE DIVISION, BOSTON REGIONAL SURVEY	4
3	URBAN DEVELOPMENT, 1885 and 1960	6
4	PER CENT OF USABLE LAND DEVELOPED, 1960	10
5	GBESC LAND USE STUDY ZONES	16
6	RESIDENTIAL LAND USE, 1960	23
7	RESIDENTIAL DENSITY, 1960	24
8	COMMERCIAL LAND USE, 1960	32
9	INDUSTRIAL LAND USE AND PROJECTED NEED, 1960 - 1980	37
10	MAJOR PUBLIC OPEN AREAS	41
11	LAND USE AND ZONING, GBESC STUDY AREA, 1960	48
12	LARGE LOT ZONING OF SUITABLE LAND, 1960	49

THE BOSTON REGIONAL SURVEY

INTRODUCTION

In July, 1961, the Mass Transportation Commission initiated a basic planning study of the Boston Metropolitan Region. The objectives of this study, the Boston Regional Survey, are (1) the preparation of a comprehensive inventory of planning studies and (2) analysis of regional research and proposals with respect to transportation, population, land use patterns, economic development, and other factors. This report is the second chapter in the overview phase of the survey. An earlier phase consisted of an annotated bibliography of all transportation, land use, population studies and other published planning reports and materials concerning the Boston region. A subsequent series of reports will constitute an inventory and analysis of major transportation proposals. The final element of the survey will be an integrated analysis and evaluation of regional plans and research.

The Boston Regional Survey is designed as an introduction to the major regional planning and transportation activities in the Boston region now being organized by the Mass Transportation Commission. These major efforts, in contrast to the present survey, will involve the gathering of new data on travel patterns and related phenomena on a large scale.

The Need for an Overview

No consistently applicable evaluation of a variety of plans in a number of different fields is feasible in the absence of a broad framework of analysis. The necessary prerequisite is a preliminary exploration of transportation, population, land use, and economic development patterns. This preliminary study has been termed an overview and its purpose is to provide a survey of all salient aspects and features of the Boston Metropolitan Region.

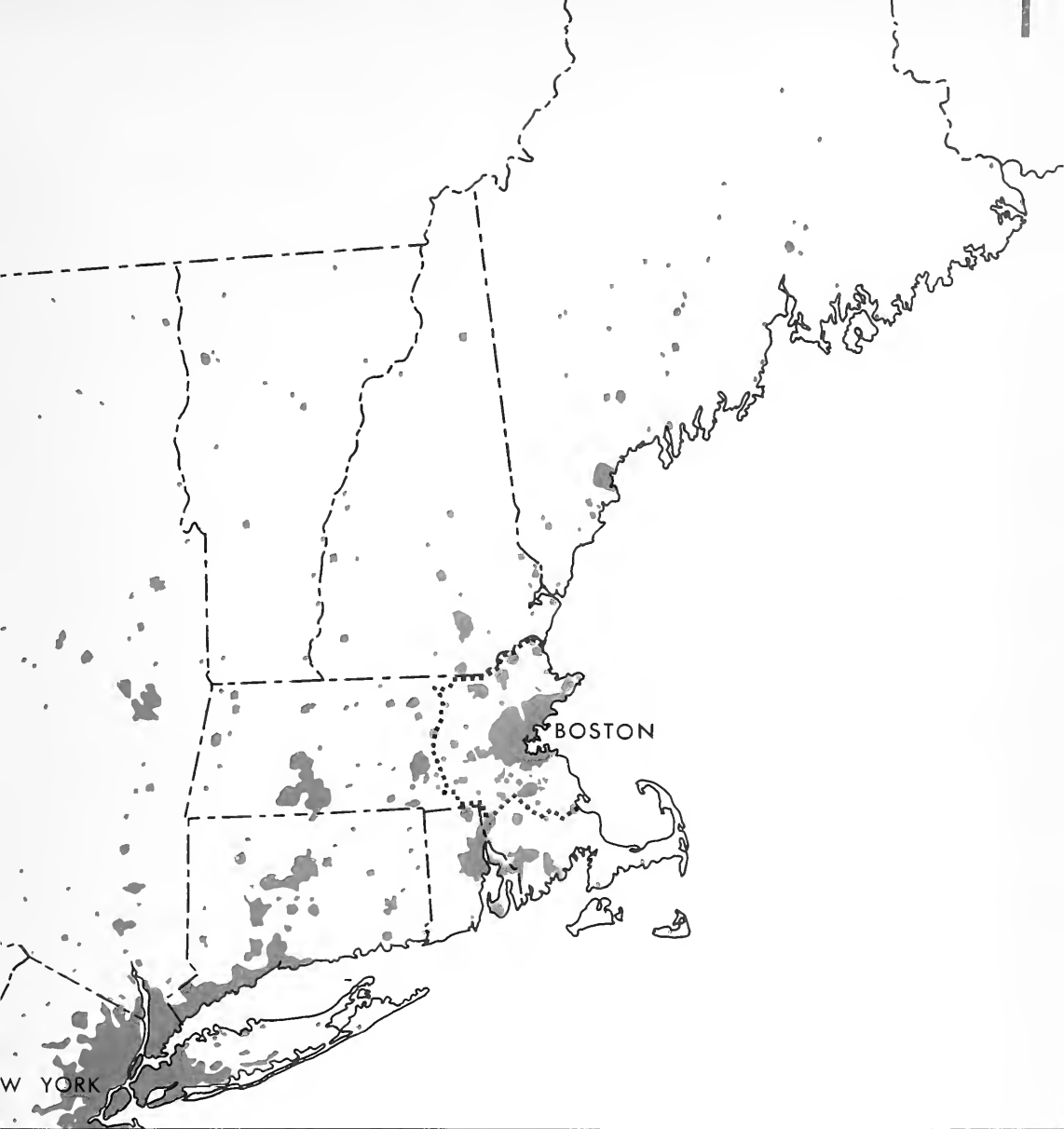
The five chapters in the overview phase of the survey include the three inventory topics which are usually considered basic in planning activities: population, land use, and economic base. Two additional elements significant to regional development patterns are also included. These are an analysis of political, social, and economic factors important to the region's development, and an evaluation of regional amenities and aesthetics.

The Study Area

The area selected for study in the Boston Regional Survey has been termed the Boston Metropolitan Region. In general this is the area referred to in this report as the "region" or the "Boston region." The location of the study area is shown on Figure 1 in relation to other major urban areas of the northeastern Atlantic seaboard. In Figure 2 the 144 cities and towns that are included in the region are shown, together with the existing and programmed expressway system. Also shown on Figure 2 is a division of the region into sectors and zones for analytic purposes.

The study area is bounded on the north by the New Hampshire border. On the west it follows roughly a line one tier of communities outside Interstate Route 495, the so-called Outer Belt. In the south, the region borders on the State of Rhode Island and the Southeastern Massachusetts Planning Region (Bristol County.) On the east the waters of Massachusetts Bay define the region.

The Boston Metropolitan Region is generally similar to the Greater Boston study area that has been utilized by the Greater Boston Economic Study Committee, a non-profit, private agency which has conducted a number of regional research studies, including a land use study. The major difference is that the GBESC area includes communities to the south (See Figure 5).



NORTHEASTERN URBAN AREAS, 1960



NORTH



625
SQ. MILES

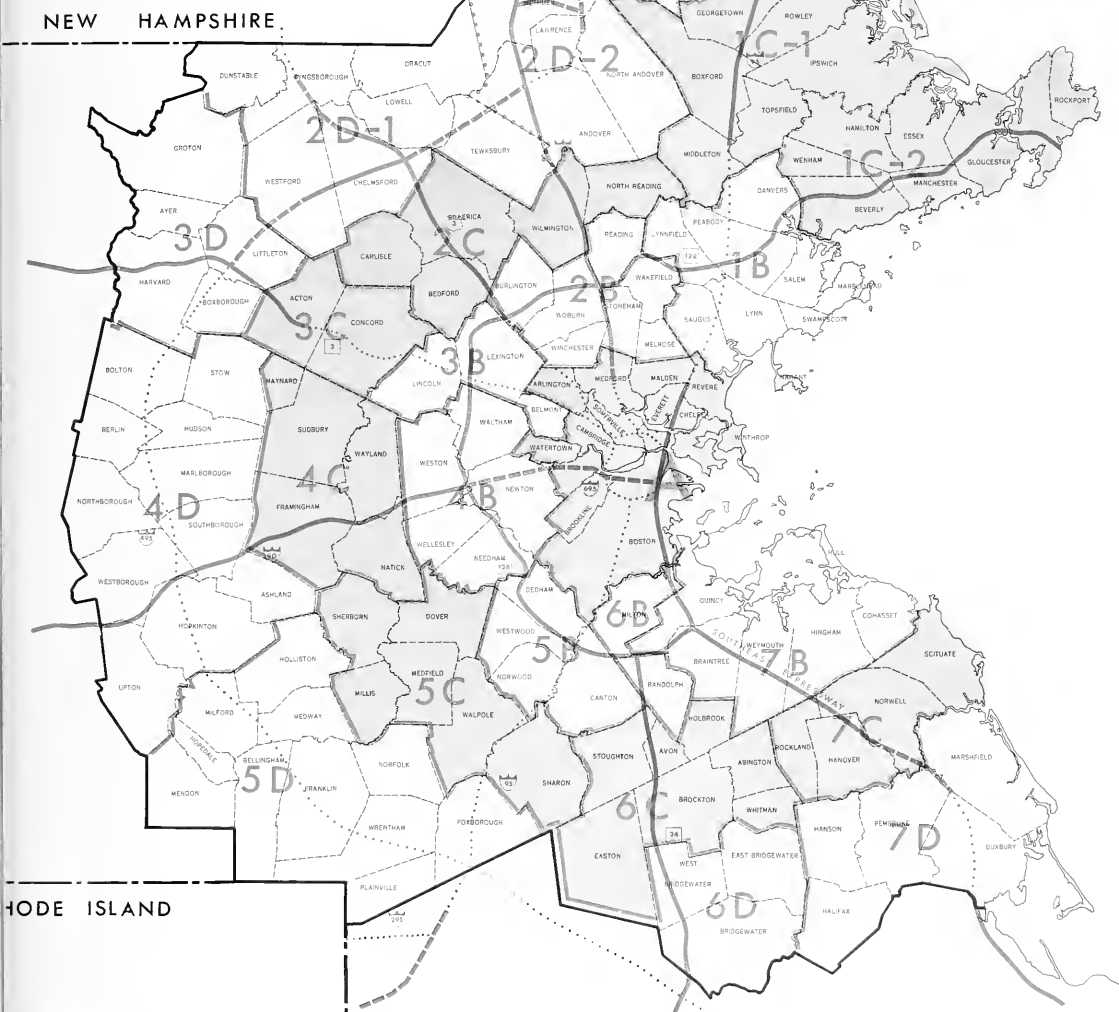
25 0 25 50 MILES



PREPARED FOR THE MASS TRANSPORTATION COMMISSION

BY THE PLANNING SERVICES GROUP, CONSULTANTS

THE PREPARATION OF THIS MAP HAS BEEN FINANCED IN PART BY THE U.S. DEPARTMENT OF TRANSPORTATION, PLANNING AND CONSTRUCTION DIVISION, UNDER THE PROVISIONS OF SECTION 101 OF THE FEDERAL AID TO HIGHWAYS ACT, AS AMENDED.



1. THE SPREAD OF URBAN DEVELOPMENT

In the three centuries since the initial Pilgrim settlement, urban development has spread over much of eastern Massachusetts. Much of this expansion occurred within the last seventy-five years, as can be seen in Figure 3, which compares the extent of urbanization in the Boston region in 1885 and in 1960. This first section discusses the factors that have been responsible for the spread of urban development throughout much of the 2,000 square miles of eastern Massachusetts contained within the Boston Metropolitan Region.

Land use changes are brought about by population and economic factors, by transportation development, and by action taken at various levels of government. In addition, the pattern of regional land use is directly affected by land configurations, water bodies, and other major physical features. These have had a major impact on development in the Boston Metropolitan Region. The general geography of the region is, therefore, considered at the outset of this chapter as a background to the subsequent examination of regional land use patterns.

Physical Determinants of Land Use

Five physiographic features of the region appear to have been particularly influential as determinants of the land use pattern:

1. The rivers of the region, especially the Charles and Mystic Rivers which enter the sea at Boston Harbor, together with the harbor itself, have exerted a major influence both by making much of the region's core area readily accessible by water and also by creating major obstacles to easy land movement between the core and other parts of the region.
2. The peninsular quality of the region's central area -- downtown Boston -- was a major asset in the earliest days of regional development because of its ready access from all sides by

NEW HAMPSHIRE

MASSACHUSETTS

URBAN DEVELOPMENT, 1885 AND 1960

1885

1960

SOURCE: USGS AND GBESC MAPS

GENERAL INFORMATION

- EXPRESSWAYS
- IN 1960 UNDER CONSTRUCTION
- PROPOSED
- MAJOR HIGHWAYS
- SECONDARY HIGHWAYS
- MAJOR RAILROADS
- SECONDARY RAILROADS
- RAPID TRANSIT LINES



NORTH



SQUARE MILES



water, an important mode of transportation through the mid-nineteenth century. A secondary feature of central Boston, the fact that the surrounding water areas were shallow and readily filled, made possible a five times expansion of the land area originally available for development. Most of the port area, the Back Bay, and the Public Garden were filled in in the nineteenth century, while substantial acreage in East Boston, including the site of Logan Airport, has been reclaimed in the past thirty years.¹ Much of this reclamation occurred in connection with one or another form of transportation. Extension of dock areas for shipping, and construction of railroad causeways across the shallow Back Bay area were especially important.

3. In the hinterland of the region and also in areas close to the Core, major wetland areas have been temporary or even permanent obstacles to development. The Saugus marshes to the north of Boston and the Neponset river mouth to the south are close-in examples of this type of feature.
4. To a limited extent, the hills of the Boston region have presented an obstacle to the spread of urban development. This has been most noticeable to the south where the Blue Hills range lies between the Boston and Brockton metropolitan areas. Other rugged areas to the north of Boston, such as the Lynn Woods and Middlesex Fells, were also obstacles to the continuous spread of development.

1. Greater Boston Development Committee, Inc., Suring Cities, Boston, 1948). See also Whitehill, Walter Muir, Boston: A Topographical History, (Boston, 1959).

Multiple Nuclei of Development

Another important feature of urban development in the Boston region has been the fact that many independent cities and towns grew up in the hinterland. Some were originally farm villages or market centers while many others sprang up with the industrial revolution as centers of shoe or textile production. Lawrence, Lowell, Haverhill, and Brockton are the largest instances of such independent urban centers but the region contains literally dozens of other, smaller urban concentrations dating back in some cases to pre-Revolutionary days.

An interesting result of the "satellite" pattern of urban development that characterizes the Boston region is the continued presence of sizeable areas of open land in the interstices of a dispersed pattern of urban centers. The availability of such open areas close to densely settled urban concentrations is a major attraction that owes much to this aspect of regional history. This bypassed land has also provided good sites for private development.

Patterns of Growth

In the first two centuries of settlement, from 1620 to 1820, development was dense only in the immediate Boston area; subsequently, urbanization spread outward, particularly to the north and along the northeast coast. Isolated, sizeable communities were also created in the Merrimack Valley to the northwest of Boston and at Brockton to the south. The railroad era inaugurated a major direction of growth to the west.

Recent settlement has followed and accentuated the earlier pattern. The regional development pattern currently resembles a series of passageways, some broader than others, reaching out to merge with older independent settlements or flowing into open country. The urban extensions to the west and northwest are exceptionally broad. Narrower

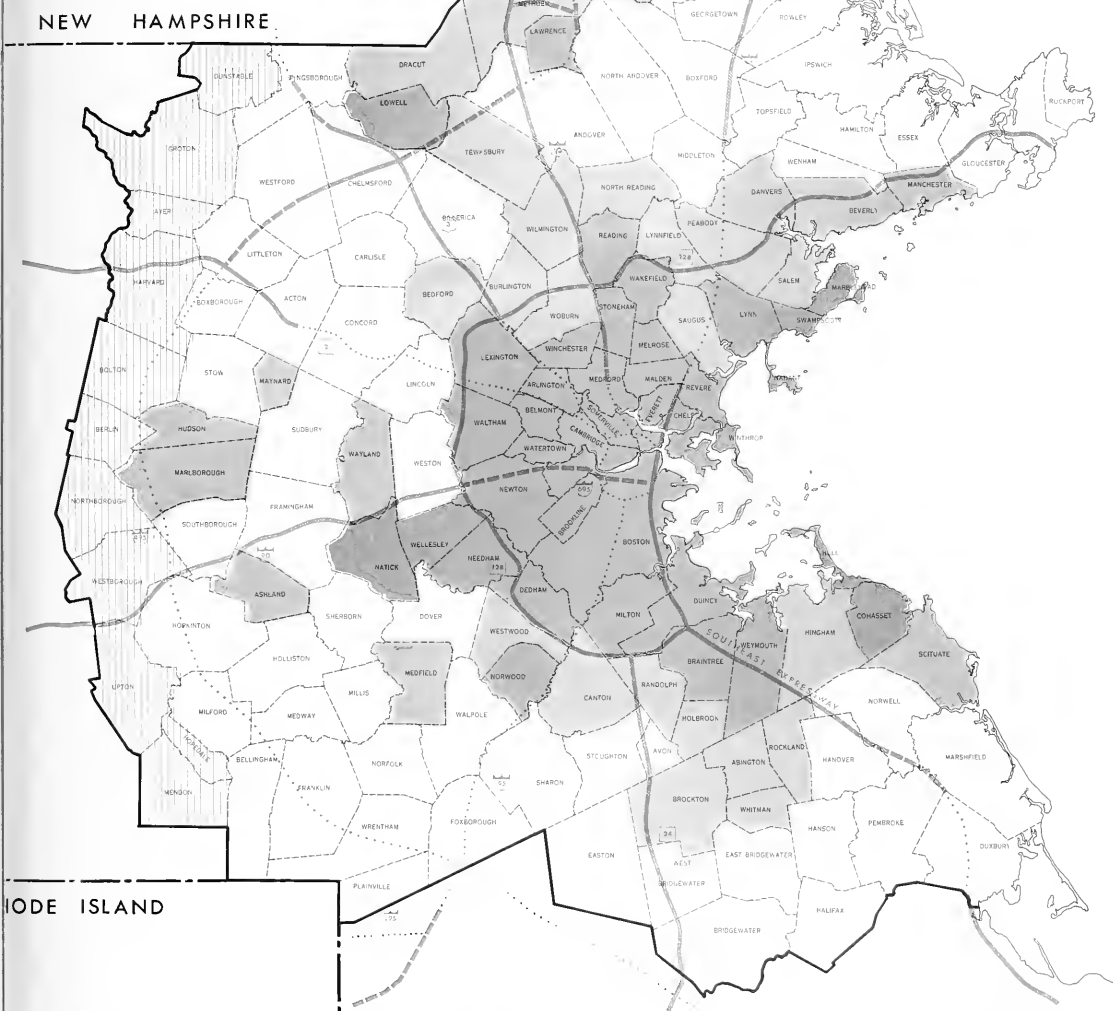


bands of settlement are apparent to southwest, northwest, and southeast. However, some communities, and in fact some entire subareas, have been partially bypassed by the urban tide. This is particularly true of much of the area to the southwest of Boston as well as of individual communities close to the Core. The key to continued low density development seems to be either isolation or difficult terrain, but equally important may be local decisions including large lot zoning and inadequate or non-existent public water or other municipal services.

Other phenomena are also apparent in the outward flow of urban development. First, there is a merging and overlapping of metropolitan areas as suburban growth proceeds outward from the cores of the Lawrence, Lowell, and Brockton areas, all less than 30 miles from the center of Boston. A second tendency is the superimposition of suburban subdivisions on earlier mill community and rural town patterns.

Figure 4, included with this section, illustrates an important aspect of the pattern of urban growth in the Boston region. This map utilizes information gathered by the Greater Boston Economic Study Committee in its regional land use survey (see Section 2, below) and shows the proportion of developable land that has been utilized for urban purposes in each community of the region. In large part it reinforces the visual impression of compactness and radial growth illustrated by Figure 3.

Another measure of the same phenomenon is contained in Table 1, which indicates the intensity of urban development in the region, again based on GBESC data. (The core, inner suburbs, outer suburbs, and outer cities cited in Table 1 refer to areas delineated on Figure 5 in the next section.) The core is virtually all developed, but nearly half of the land in the inner suburbs -- generally speaking, the communities along Route 128 -- remains open, and only a small proportion of the



INTENSITY OF LAND USE IN SUB-AREAS OF THE GBESC STUDY AREA, 1960

Intensity	AREA				Total Area
	Core	Inner Suburbs	Outer Suburbs	Outer Cities	
Per cent of total land developed	91%	54%	19%	47%	30%
Developed acres per 1,000 population	51	146	278	78	130
Persons per acre of residential land	35	11	6	20	13

1. The GBESC study area as defined in the Land Use survey is slightly larger (by about 220 square miles) than the Boston Metropolitan Region. (See Figure 5.) The GBESC area contains 2,220 square miles compared to 2,000 square miles in the Boston Metropolitan Region.

Source: GBESC, Greater Boston Land Use in 1960, Land Use Report No. 1, (May, 1961).

land in the outer suburbs has thus far been preempted for urban use. The four "outer cities" of Brockton, Haverhill, Lawrence, and Lowell resemble the pattern of the inner suburbs more than that of the Core in this regard.

Transportation Factors

The locations of major transportation routes and terminal points, and the different characteristics of water, rail, and vehicular travel technologies, have had a major influence on the urban development pattern. Forthcoming reports in the Boston Regional Survey, concerned with each of the major transportation systems of the region, will examine these influences in some detail. Briefly stated, the principal influences on the overall pattern of regional development that have been exercised by each of the major transportation systems appear to have been as follows:

1. Water Transportation. The many streams and harbors of the region made possible the early development of coastal settlements linked to one another by water. Salem, Marblehead, and Gloucester are instances of such communities. The fact that the region's streams do not generally penetrate deep into the interior limited the influence of water transportation to the shoreline and to areas near river mouths. Watertown and Cambridgeport on the Charles River are instances of the few "inland" communities near Boston that were accessible for commercial shipping.

Various nineteenth century efforts were made to improve the interior waterways of the of the region, of which the most ambitious were the Middlesex Canal from the Mystic River to Lowell and the attempt to construct a Boston to Albany canal. After a brief period of prominence these efforts to utilize water transport to reach inland areas were superseded by the burgeoning railroad network.

2. Rail Transportation. In very large measure, the basic urban pattern of the Boston region was created by the railroad. The introduction and spread of the railroad (and its outgrowth, the inter-urban street railway,) coincided with the acceleration of urban expansion in the region and with the rapid rise of the textile and shoe industries in the period following the Civil War. Urban settlements throughout the region grew up along the railroad and major axes of regional development followed major rail routes. In addition, the land use pattern of downtown Boston can in large part be related to the efforts of various railroads to establish routes and terminals in the water - surrounded peninsula of Boston.

Today, despite a relative decline in its importance as compared to the motor vehicle, the railroad is still a significant element in determining the region's land use pattern. One instance of this influence is in terms of the proposed conversion of several rail routes to rapid transit service. Based on experience, such action would probably result in an increase in density of development along the route and especially near transit stations.

3. Motor Vehicle Transportation. Before the invention of the internal combustion engine, horse-drawn vehicles constituted an important element in the regional transportation system. Since the early years of the twentieth century, the self-powered motor vehicle has opened up possibilities of travel in a multitude of directions; it has had a very great influence on urban development and land use for at least the last four decades.

The astonishing multiplication of automobiles has been a major cause of the spread of development throughout previously open areas of the region in the now-familiar suburban pattern. Vast numbers of motor vehicles have congested urban centers, especially downtown Boston, and have called forth an increasing effort to cope with their parking and movement requirements. The most notable element that has been created to meet the increasing needs of vehicular travel is the regional system of expressways. Although many components of this system are as yet incomplete, the ring-and-radial network of limited-access roads has already had a major influence on the regional land use pattern and it appears likely to be the single most important transportation factor in determining the future regional land use pattern.

Subsequent elements of the Boston Regional Survey will consider the relationships between transportation elements and the regional development pattern at greater length. These interrelationships will also be the subject of a major planning and demonstration program that will be undertaken by the Mass Transportation Commission.

Comprehensive information on the existing pattern of land use in the Boston Metropolitan Region is available as a result of the recent completion of a study conducted over the past two years by the Greater Boston Economic Study Committee (GBESC.)¹ For the most part the detailed information on land use patterns presented in this section is derived from the GBESC study which resulted in the preparation of the first existing land use map ever made for the Boston region.

The GBESC land use map, included with their recent report, is a reduced-size version of a fifteen foot square land use map which consists of color overlays on a base of United States Geological Survey maps. The large map was prepared by the GBESC staff from a variety of sources, including surveys by local planning staffs, planning consultants, state agencies, and field reconnaissance (in part with the assistance of Mass Transportation Commission personnel.)

Because of the variety of sources that were utilized, and because of limitations of time and funds, the land use map and the measurements derived from it are necessarily generalized. This limitation is not important for purposes of an overview study such as the Boston Regional Survey, but it should be recognized that for many planning purposes, both of a local and a regional nature, additional detailed information is essential.

Tables 2 and 3 present a summary of information from the GBESC land use survey. In Table 2 the data is presented on the basis of four sub-areas developed by GBESC for its land use analysis (see Figure 5 which shows the GBESC land use sub-areas.) In Table 3 a less detailed summary, taking into account only three basic urban land uses -- residential, commercial, and industrial -- is presented for the more detailed set of analytic sub-areas that has been developed for the Boston Regional Survey.

1. GBESC, Land Use in Greater Boston; Land Use Report No. 1 (May, 1961)

NEW HAMPSHIRE

OUTER SUBURBS

INNER SUBURBS

CORE

RHODE ISLAND

GBESC LAND USE STUDY ZONES



OUTER CITIES



NORTH



25
SQUARE MILES



MILES

TABLE 2

LAND USE IN SUB-AREAS OF THE GBESC STUDY AREA, 1960 (in thousands of acres)

Land Use	Core		Inner Suburbs		Outer Suburbs		Outer Cities		Total Area	
	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per Cent
Developed Land										
Residential	41.7	56.7	83.4	60.9	130.9	59.1	14.3	69.9	270.3	59.5
Commercial	4.8	6.6	4.5	3.3	5.2	2.4	0.8	3.6	15.3	3.4
Industrial	6.1	8.2	5.6	4.1	5.7	2.6	1.3	6.0	18.7	4.1
Public Utilities	2.9	4.0	6.1	4.4	8.7	3.9	1.2	5.4	18.9	4.2
Institutions	8.6	11.7	14.4	10.6	35.5	16.0	1.7	7.9	60.3	13.3
Recreation	9.5	12.8	22.8	16.7	35.5	16.0	2.7	12.2	70.4	15.5
Sub-Total, Developed Land	73.6	100.0	136.8	100.0	221.5	100.0	22.0	100.0	453.9	100.0
Undeveloped Land										
Land Management	0.7		1.8		19.3		0.1		21.9	
Vacant and Agricultural	6.5		116.0		931.4		25.2		1,079.2	
Total Land	80.8		254.6		1,172.2		47.3		1,555.0	

Source: GBESC. Greater Boston Land Use, 1960, Land Use Report No. 1, (May, 1961).



TABLE 3

LAND USE IN GREATER BOSTON: NUMBER OF ACRES DEVOTED TO RESIDENTIAL, COMMERCIAL AND INDUSTRIAL USES BY BOSTON REGIONAL SURVEY SECTORS AND ZONES,¹ 1960

Sector	Total ²	Number of Acres			
		Residential		Commercial	Industrial
		Single-family	Multi-family		
A	63,800	11,700	18,200	4,700	5,900
1-B	49,600	13,900	2,100	1,300	1,300
2-B	37,000	13,300	600	800	1,100
3-B	22,800	6,900	400	100	100
4-B	44,500	18,200	1,200	600	1,300
5-B	32,600	9,400	400	400	1,400
6-B	14,700	4,800	20	-	-
7-B	51,700	14,300	1,600	1,100	1,000
Zone Sub-total	252,900	80,800	6,320	4,300	6,200
1C-1 ¹	89,700	7,500	20	300	200
1C-2	59,100	9,900	400	400	200
2-C	53,900	9,400	200	200	600
3-C	28,300	3,200	-	30	100
4-C	53,600	11,800	400	1,000	900
5-C	67,600	8,100	100	100	300
6-C	59,800	11,700	1,200	800	800
7-C	40,100	5,900	10	200	200
Zone Sub-total	452,100	66,805	2,330	3,030	3,300
1-D	37,900	3,400	300	400	200
2D-1	90,500	13,500	1,000	500	900
2D-2	55,600	7,900	1,300	400	900
2D-3	26,900	3,500	600	200	200
3-D	61,000	3,400	50	200	300
4-D	125,900	11,300	300	500	500
5-D	115,700	10,400	800	500	600
6-D	38,000	3,000	30	200	300
7-D	67,100	9,100	10	300	100
Zone Sub-total	618,600	65,500	4,390	3,200	4,000
GRAND TOTAL	1,387,400	223,805	31,240	15,230	19,400

(See following page for notes to Table)

1. See Figure 2 for sectors and zones.
2. The total includes land devoted to public utilities, institutional, government, recreation and land management uses as well as the three categories included in the table.

Source: GBESC, Land Use in Greater Boston in 1960, Land Use Report No. 1, The sectors and zones were formulated by The Planning Services Group.

Principal Features of the Land Use Pattern

Analysis of the GBESC regional land use map, and the data presented in Tables 2 and 3, indicate some of the major characteristics of the regional land use pattern. Among the more salient features are the following:

Open Character of the Region. Although the Boston region is one of the longest inhabited and most densely settled parts of the nation, it is far from being completely developed. Two-thirds of the region (a million acres out of a million and a half) consists of open land, most of it wooded. Trailing well behind in second place, with only about a fifth of the total land, is residential land use, most of which is devoted to single-family residences. Other land uses represent even less significant fractions of the regional pattern, with manufacturing and commercial uses, the chief components of the economic base, comprising only 7.5% of all regional land.

Dominance of the Core. Despite trends toward decentralization, the Core area still contains the largest concentrations of most urban land uses. This dominance is marked in multi-family residential, industrial, and commercial uses: the Core, which contains only about 6% of the region's total land area, contains one-third of its industrial and commercial land and two-thirds of its multi-family acreage. The land use map indicates clearly the heavy concentration of industrial land uses in and around Boston harbor and the concentrations of commercial uses in downtown Boston, and similar but smaller clusters in other Core communities and other parts of Boston.

The dormitory function of the North Shore, South Shore, and most outlying areas is also evident, although this pattern varies considerably from community to community and from sub-area to sub-area. In addition to a multitude of individual communities which, except for

minor patches of commercial use, are exclusively residential in nature, there are entire zones in which most of the labor force must commute ten, twenty, or more miles to work.

Spread of Residential Uses. In each of the sub-areas outside the Core, residential uses account for about three-fifths of the total developed urban land. Aside from industrial concentrations in a few mill towns, the predominant land use in suburban areas is single-family residence. There are, however, significant differences between the inner and outer suburbs. Most of the developable land area inside Route 128 has been filled in by residential subdivisions and other urban development. In contrast, urban settlement in the suburban and outlying communities beyond Route 128 has so far clung closely to major highway radials, leaving substantial amounts of vacant land in the interstices.

Open Nature of Outer Cities. The four outer cities (Brockton, Lawrence, Lowell and Haverhill) which together contain only three per cent of the region's land area, contain a fifth of the region's developed land. While Lawrence is almost completely developed, the other outer cities contain a good deal of land for expansion. In fact, more open land exists in the outer cities than is currently used for urban purposes.

Characteristics of Major Land Use Categories

In the remaining portions of this section, mention is made of some of the most important characteristics of the major urban land use categories, as indicated both by GBESC's study and by other sources.

Residential Land Use

Shown on Figure 6 is a graphic depiction of the residential land use pattern of the Boston Metropolitan Region. This map illustrates

the dominant role played by the region's Core as a site for multi-family housing and the pattern of single and multi-family residential use relationships in the remainder of the region. The next map, Figure 7, shows the pattern of residential density by communities in the Boston region. It illustrates the decreasing density with distance from the Core or major sub-centers that is a common feature of metropolitan development.

Figure 7 conceals a great number of residential density variations which exist among neighboring communities and even between neighborhoods within a single community. For example, there is still considerable open territory (in the form of large estates) even in such long-settled, built-up Core communities as Brookline; there is multi-family housing in suburban communities like Norwood and Newton; and there are dense clusters of small houselots adjoining country estates in the outer suburbs. Thus, while the map presents a general picture of the region which is accurate on a broad territorial basis, it necessarily omits the many community exceptions which lend considerable variety to the region's housing pattern.

Residential Construction Patterns

Table 4 presents the number and per cent distribution of dwelling unit permits issued in the region in the years 1950 and 1960. In both years residential building in the Boston region was devoted primarily to the construction of single family dwellings: four-fifths of all permits issued in 1950 and 1960 were for single family houses.

While the Boston Standard Metropolitan Statistical Area (SMSA)¹ remains the leader in total dwelling unit construction, the building

1. As defined for purposes of the Boston Regional Survey, the Boston Metropolitan Region contains all or most of four SMSA's: Boston, Brockton, Lawrence-Haverhill, and Lowell.

NEW HAMPSHIRE

MASSACHUSETTS

RESIDENTIAL LAND USE, 1960

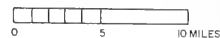
■ 2,000 ACRES OF SINGLE FAMILY RESIDENTIAL AREA

□ 2,000 ACRES OF MULTI-FAMILY RESIDENTIAL AREA

SOURCE: GBESC LAND USE STUDY

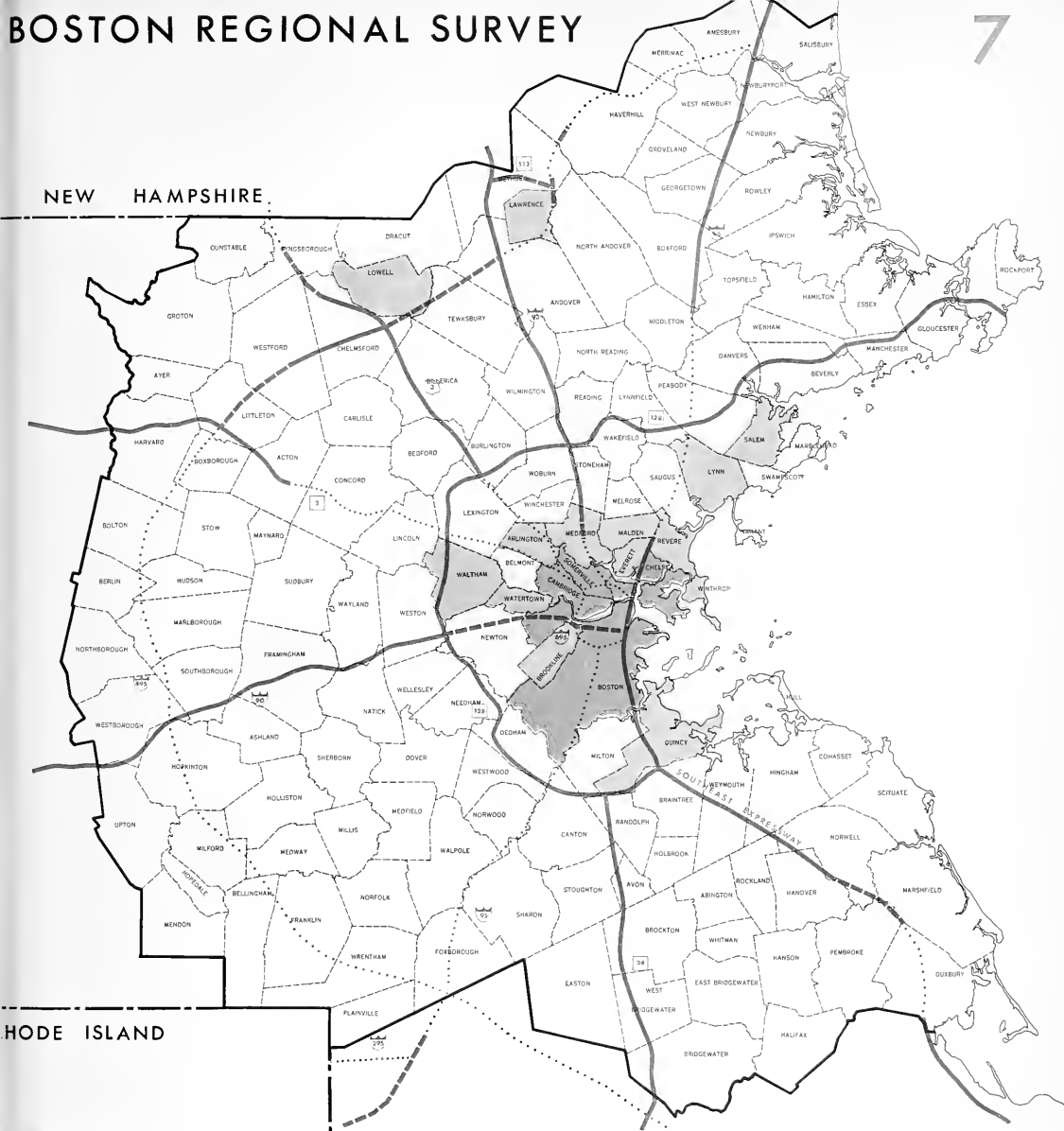
GENERAL INFORMATION

- EXPRESSWAYS
- UNDER CONSTRUCTION
- PROPOSED
- MAJOR HIGHWAYS
- SECONDARY HIGHWAYS
- MAJOR RAILROADS
- SECONDARY RAILROADS
- RAPID TRANSIT LINES

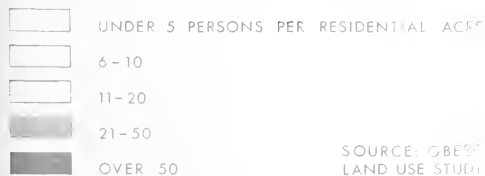


BOSTON REGIONAL SURVEY

7



RESIDENTIAL DENSITY, 1960



SOURCE: GBE'S
LAND USE STUDY

GENERAL INFORMATION

- EXPRESSWAYS
- UNDER CONSTRUCTION
- PROPOSED
- MAJOR HIGHWAYS
- SECONDARY HIGHWAYS
- MAJOR RAILROADS
- SECONDARY RAILROADS
- RAPID TRANSIT LINES



NORTH



0 5 10 MILES

TABLE 4

DISTRIBUTION OF BUILDING PERMITS¹ ISSUED IN THE BOSTON METROPOLITAN REGION IN 1950 and 1960

Type of Dwelling Unit	Number of Permits		Per cent of Regional Total	
	1950	1960	1950	1960
Single Family Dwellings				
Cities				
Core ²	2,090	944	12.9	6.3
Outer Cities ³	471	1,245	2.9	8.3
Suburbs				
Boston SMSA suburbs	9,269	6,866	57.1	45.6
Three other SMSA suburbs	1,060	1,604	6.5	10.6
Suburbs outside SMSA's	308	1,566	1.9	10.4
Total Single Family	13,198	12,225	81.3	81.2
Multi-Family Dwellings ⁴				
Cities				
Core ²	1,673	1,535	10.3	10.2
Outer Cities ³	400	27	2.5	0.2
Suburbs				
Boston SMSA suburbs	938	1,148	5.8	7.6
Three other SMSA suburbs	-	58	-	0.4
Suburbs outside SMSA's	24	61	0.1	0.4
Total Multi-Family	3,035	2,829	18.7	18.8
TOTAL DWELLINGS	16,233	15,054	100.0	100.0

1. The dwelling unit permit data were compiled from actual counts for each town in the region. They are single year counts and do not represent an average, thus, the possible range of variation in any one year is considerable. However, observation of permits for other years indicates that the differences between 1950 and 1960 are representative of actual trends, but because of business recessions and other causes, there are considerable fluctuations from year to year. The attrition rate (permits issued but not acted upon) represents about 2% of the total.
2. The core consists of 15 inner cities as defined by GBESC (See Figure 5).
3. The four cities of Brockton, Haverhill, Lawrence and Lowell.
4. The multi-family category includes two-family structures.

Source: Massachusetts Department of Labor and Industries, Summary of Building Permit Activity, 1950 and 1960.

permit data in Table 4 indicates an important change in distribution of dwelling construction. The proportion of all regional construction of single-family dwellings in the Boston SMSA declined over the ten year period. Single-family construction in the Core fell by over 50%, and in Boston metropolitan area suburbs by about 20%. An increase in single family construction in the outer cities category was primarily due to a sharp gain in the city of Brockton, which accounted for more than one-half of all of the building permits issued in 1960 in the outer cities. Interstitial areas outside the region's SMSA's experienced the greatest increase in single family building, with their share increasing from less than two per cent to ten per cent of all regional residential construction.

Multi-family dwelling construction is a field in which the Boston region has followed rather than led other parts of the nation. Between 1950 and 1960, regional construction of multi-family units averaged only about 3,000 per year, accounting for only one-fifth of the total number of dwelling units built in the decade. In contrast, it is estimated that apartment buildings represented 45-50% of units constructed during 1950-1960 in the New York-New Jersey metropolitan area, 20-25% in the Chicago area, and 35-40% in the San Francisco area.¹ The strong trend toward large scale building of cooperative apartments and other types of middle income, multi-family dwellings apparent in other large metropolitan centers has not been prevalent in the Boston area. The situation does appear to be changing, however. Of the 16,000 permits issued in 1961 for construction of dwelling units in the region, 35% were for multi-family units.

1. Urban Land Institute, "New Approaches to Residential Land Development", Technical Bulletin No. 4, (January, 1961).

The Need for Residential Renewal

The continuing decline of population in the central areas of the region -- both in the communities of the Core and in the outlying urban centers -- is closely correlated with the decay and deterioration of housing in these older, densely built-up communities. Also, the competition offered by newer, single-family housing in suburban locations has been a factor in stimulating relocation from city to suburbs. The answer to the question as to whether or not this process can be slowed, much less reversed, depends on the probability of success in efforts to renew the residential neighborhoods of the region's central cities.

The physical condition of the housing stock in the Boston region appears to be generally in line with conditions in other large eastern urban centers. In the region as a whole, about one out of every eight dwelling units is substandard. As can be seen in Table 5, housing conditions in the Boston and Brockton SMSA's are somewhat better than in either the Lawrence-Haverhill or Lowell metropolitan areas. Substandard dwellings include units that are dilapidated as well as those that were classified as deteriorating by the Census Bureau.¹ In the region as a whole, dilapidated units represent only about 2.5% of the total number of residences.

However, the situation with respect to substandard housing is far more serious in the Core portions of the region where as much as

-
1. The Census defines a dilapidated dwelling unit as follows: A dwelling unit was reported as dilapidated when it had serious deficiencies, was rundown or neglected, or was of inadequate original construction, so that it did not provide adequate original shelter or protection against the elements or endangered the safety of the occupants. A deteriorating dwelling unit is one that is not dilapidated but lacks certain basic facilities such as plumbing.

one sixth of all housing may be substandard. As can be seen in Table 5, the percentage of substandard housing in Boston is estimated at 20%, and at about the same level in other Core communities such as Revere and Chelsea.

Hopes for a solution to Core area housing problems lie in the success of the urban renewal efforts that have been stimulated by the federal Housing Acts of 1949, 1954, and 1961. Especially important is the concept of rehabilitation first introduced in the 1954 act and extended in concept in subsequent federal legislation.

There seems to be no doubt that large scale slum clearance and redevelopment is too expensive for general application over large urban areas. It has been estimated, based on New York City experience, that "a square mile of rotted urban streets and structures" may run to \$160 million for site acquisition alone.¹ While the cost of acquiring a square mile of slums in the Boston region may be on the order of \$50 million or so, neither the municipalities nor the Commonwealth, nor even the federal government, appear to be financially capable of supporting a massive program composed solely of land clearance and redevelopment. For this reason, renovation and rehabilitation, combined with limited amounts of clearance of the worst blight, appear to hold the greatest promise. Efforts such as the massive program initiated by the Boston Redevelopment Authority will be important determinants of the future of the Core. The intensity of land use and land use patterns, future population density and distribution, levels of mass transit patronage, and other key development trends in the Core and the region's central cities may hinge on the degree to which close-in housing areas can be revitalized.

1. Vernon, Raymond "The Economics and Finances of the Large Metropolis, " Daedalus: The Future Metropolis, (Winter, 1961).

SUBSTANDARD HOUSING IN THE BOSTON METROPOLITAN REGION AND
SELECTED AREAS, 1960

Area	Total Number of Dwelling Units (in thousands)	Per cent* Substandard	Per cent Dilapidated
Boston Region SMSA's			
Boston	814.1	12.3	2.3
Brockton	46.0	11.9	2.4
Lawrence-Haverhill	53.3	16.9	2.9
Lowell	48.9	14.4	2.9
Other Selected SMSA's			
Providence-Pawtucket	269.6	12.3	2.5
Springfield-Holyoke	151.6	13.2	2.1
Hartford	164.0	16.4	2.0
Selected Cities			
Boston	238.8	19.2	3.9
Brockton	24.1	12.3	2.0
Lawrence	24.4	19.8	3.3
Lowell	30.0	14.8	2.5
Brookline	19.6	5.1	0.6
Cambridge	35.3	13.7	3.0
Newton	26.1	4.7	0.8
Somerville	29.2	14.0	1.6
Waltham	15.0	7.2	0.5
Providence	73.0	16.3	2.9
Springfield	58.7	19.0	3.1
Holyoke	18.6	9.4	0.4
Hartford	57.6	14.0	3.0
New York	2,758.1	15.5	3.1
Philadelphia	649.0	12.7	2.1

* Substandard includes both dilapidated and deteriorating buildings as defined by the U. S. Bureau of the Census.

Source: U. S. Census of Housing, Advance Reports, 1960.

Commercial Land Use

The accompanying map, Figure 8, indicates the distribution of land utilized for commercial purposes ¹ by sectors and zones of the Boston region, based on the GBESC land use survey. The GBESC study grouped together many different types of commercial activity into a single land use category, making it difficult to draw conclusions about specific types of commercial activity from acreage figures which include all types of commercial land. Also, because of different standards of retail commercial development in the Core and suburban areas, there is a need for commercial floor space comparisons, as well as of land area to floor space.

Commercial land in the region is divided fairly evenly between the Core area and the inner and outer suburbs. Downtown Boston, ² the specialized center of financial, service, and other region-serving commercial activities, contains almost 3% of the region's commercial land area and devotes over a quarter of all its land area to commercial uses. The ratio of commercial land to total developed land decreases with distance from the Core, while the amount of commercial land per capita apparently increases in the suburbs.

-
1. Commercial land as defined by GBESC includes acreage devoted to retail activities, business and personal services, and commercial amusements.
 2. Downtown Boston has been defined by GBESC as the area bounded by Massachusetts Avenue, Fort Point Channel, and the Charles River.

A recent survey of retail shopping areas by the Boston Globe¹ covered a substantial part of the Boston Metropolitan Region, including the Core, all of the inner suburbs and 59 of the 100 outer suburbs. However, none of the four outer cities were included. The survey distinguished between conventional shopping districts and planned shopping centers, but excluded Downtown Boston and shopping districts of less than five stores. On the basis of the Globe survey, estimates were developed of total floor space for the various centers and districts. Table 6 presents these estimates and shows retail floor space separately for shopping districts and planned shopping centers in the Core, the inner suburbs and those outer suburbs for which data are available. In developing these estimates, 9.5 million square feet of floor space was added to the total floor space in shopping districts in the Core to account for Downtown Boston. This addition was based on surveys conducted by the Boston City Planning Board.²

Table 6 indicates: (1) floor space in planned centers accounts for only a tenth of total retail floor space in the Boston area; (2) almost half of the floor space in planned centers is located in the inner suburbs; and (3) despite trends toward suburbanization, the Core still contains the bulk of the area's retail floor space. There appears

-
1. The Boston Globe, Shopping Centers and Shopping Districts in the Boston Market; (April 1962), prepared under direction of Robert L. M. Ahern, Promotion-Research Department by George K. Lewis and Saul B. Cohen, Department of Geography, Boston University.
 2. Boston City Planning Board, A General Plan for the Central Business District, (1960).

NEW HAMPSHIRE









RIODE ISLAND

COMMERCIAL LAND USE, 1960

500 ACRES OF COMMERCIAL USE

SOURCE: GBESC LAND USE STUDY

GENERAL INFORMATION

-  EXPRESSWAYS
-  UNDER CONSTRUCTION
-  PROPOSED
-  MAJOR HIGHWAYS
-  SECONDARY HIGHWAYS
-  MAJOR RAILROADS
-  SECONDARY RAILROADS
-  RAPID TRANSIT LINES



0 5 10 MILES

SYMBOL APPEARS ONLY WHEN LISTED. ITEM IS SHOWN ON MAP.

THE PREPARATION OF THIS MAP HAS BEEN FINANCED IN PART THROUGH AN URBAN PLANNING ASSISTANCE GRANT FROM THE U.S. HOUSING AND HOME FINANCE AGENCY UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED.

RETAIL FLOOR SPACE IN THE BOSTON AREA,¹ 1962

(in thousands of square feet)

	Core	Inner Suburbs	Outer Suburbs	Total Square Feet	Percent of Total
Conventional Shopping Districts					
Region-serving	9,000	2,000	300	11,300	26.4
Community & Local	17,000	7,000	3,000	27,000	62.9
Total	26,000	9,000	3,300	38,300	89.3
Planned Shopping Centers					
Region-serving	-	1,000	-	1,000	2.3
Community & Local	2,000	1,000	600	3,600	8.4
Total	2,000	2,000	600	4,600	10.7
TOTAL SQUARE FEET	28,000	11,000	3,900	42,900	-
Per Cent of Total	65.3	25.6	9.1	-	100.0

1. The sub-areas, Core and Inner Suburbs, correspond to the areas as defined on Figure 5. The outer suburbs, however, include only 59 of the 100 outer suburbs represented in Figure 5.

Source : Estimated by The Planning Services Group from data compiled by : The Boston Globe, Shopping Centers and Shopping Districts in the Boston Market, (April, 1962).

to be an average of about 4.5 square feet of retail floor space per capita in regional shopping facilities, as compared to 11 or 12 square feet per capita in community and local-oriented facilities.

In the Boston region planned shopping centers have been almost exclusively devoted to shopping and business services. Entertainment facilities are minimal and civic features (such as auditoria or public offices) as well as multi-family housing of the type found in proximity to pace-setting centers elsewhere in the nation have not been developed in this area. Thus, the region's shopping centers have not developed a range of activities comparable to the wide variety associated with Central Business Districts.

Continued expansion of additional planned regional and subregional centers almost wholly oriented toward the automobile shopper can be anticipated in future years along with additional strip developments extended along urban arterials and older highways. Large scale programs for renovation of older shopping districts can also be expected, including attempts to adapt these areas to automobile use.

Industrial Land Use

The pattern of regional industrial land use was the subject of a recent report prepared for the Greater Boston Economic Study Committee.¹ This report analyzed recent and projected industrial employment patterns and related these patterns to present and projected industrial land use. Figure 9 illustrates the nine sub-regions into which greater Boston was divided for purposes of the industrial land analysis, and also presents a graphic summary of the existing and projected pattern of industrial land use.

1. GBESC, Industrial Land Needs Through 1980, Land Use Report No. 2, (May, 1961). Prepared by The Planning Services Group.

The Existing Pattern. At present, only 15,300 acres, a very small fraction of Greater Boston's total area, is actually used for industrial purposes, and almost 40% of this industrial land is located in the Core. As of 1960, over three and a half times as much open land had been zoned for industry as was in use for industrial purposes. In contrast to the way in which the Core dominates the industrial use pattern, the bulk of the industrially zoned land is in the suburban and outlying portions of Greater Boston. Industrial parks or planned districts are increasingly important in the region's industrial landscape. It has been estimated that they account for well over half of all land brought into industrial use between 1950 and 1961.

The Projected Pattern. Between 1960 and 1980, it is estimated that over 8,000 additional acres of industrial land will be required to accommodate the increase in manufacturing and wholesaling activity projected for Greater Boston, a land use gain of more than 50% over 1960. The projected twenty-year increase reflects two major factors: a projected gain of nearly 170,000 manufacturing jobs and the tendency of modern industry to use an increasingly greater amount of land per worker.

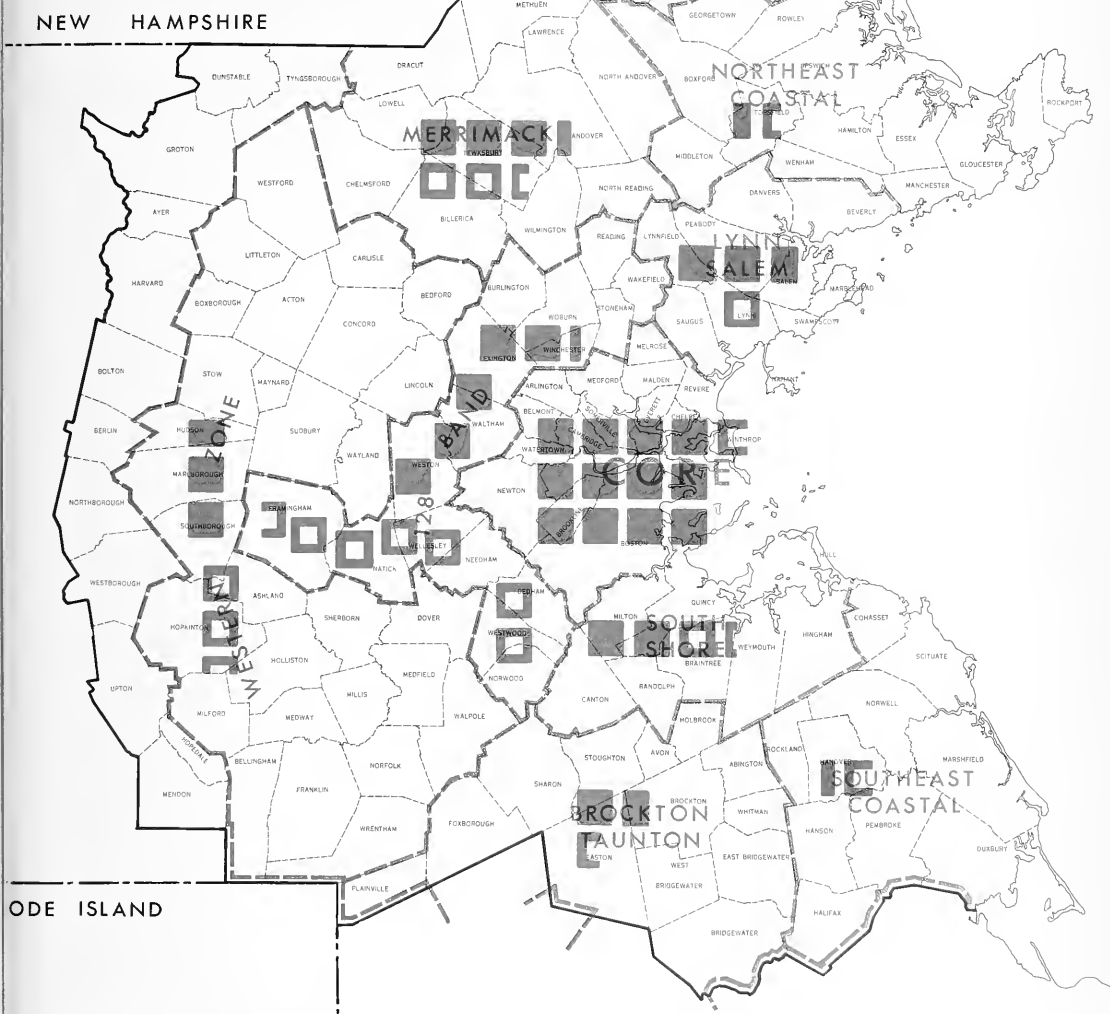
If the major influences on location continue to work through 1980 in about the same way as they have in the recent past, the report suggests that 40% of all new industrial land will be located in the Route 128 area. The Merrimack Valley and the Western sub-regions will each account for just under 15% of the net gain, the Lynn-Salem and South Shore areas will receive 6.5% and 7.0%, respectively, and the Core and the Southeast Coastal regions will each capture about

five per cent. Very little new industrial land is expected to come into use in the Brockton-Taunton and Northeast Coastal areas.

Among other findings, it is significant that the region's growing industrial categories--electrical machinery and ordnance production--tend to be land-intensive, requiring little ground space per worker. The region contains very little extensive industry while both of its large, declining categories--textiles and leather--tend to be moderately extensive users of land. Thus, despite the increasing trend of modern industry to spread out in one story suburban buildings, the region's changing industrial structure will tend to reduce the amounts of land that will be required for future needs.

One of the region's most distinctive land use features is the almost continuous chain of modern industrial parks and industrial plants on or adjacent to Route 128, the circumferential expressway which arcs through the region approximately 10 to 12 miles out from the center of Boston. This particular type of development, constituting virtually a permanent industrial exposition, has attracted nationwide attention and engendered numerous attempts at emulation. The GBESC industrial land study presents information on 60 industrial parks in the Greater Boston area.

As might be expected, about 40% of the region's industrial park acreage is found in the communities along Route 128. The largest amount of new industrial acreage created in industrial parks occurred in the period 1956-1959. Considerable recent slowing of new industrial park development in the Route 128 area was apparent in the 1960-61 period, but major activity has been taking place in the Western and South Shore sub-regions.



INDUSTRIAL LAND USE AND PROJECTED NEED 1960 - 1980

- 500 ACRES OF INDUSTRIAL LAND, 1960
- 500 ACRES OF LAND TO BE USED FOR INDUSTRY, 1960-80

SOURCE: GBESC INDUSTRIAL LAND STUDY

GENERAL INFORMATION

- EXPRESSWAYS
- UNDER CONSTRUCTION
- PROPOSED
- MAJOR HIGHWAYS
- SECONDARY HIGHWAYS
- MAJOR RAILROADS
- SECONDARY RAILROADS
- RAPID TRANSIT LINES



THE PREPARATION OF THIS MAP HAS BEEN FINANCED IN PART THROUGH AN URBAN PLANNING ASSISTANCE GRANT FROM THE U.S. HOUSING AND HOME FINANCE AGENCY UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED.

The average size of the region's industrial parks is 120 acres, with only four parks over 400 acres and 37 under 100 acres. Total acreage in industrial parks as of 1961 was 7,200, of which two-thirds was still open and available for use.

Recreational Land Use

The recreational land category, as defined for purposes of the GBESC survey, included land used for (1) local parks and playgrounds serving neighborhoods or communities, (2) parks, forests or reservations serving the region or a number of communities, and (3) private areas such as scout camps, golf courses, country clubs, and hunting and fishing clubs. Of the total of 70,000 acres of recreation land in the GBESC study area, 25,000 acres was in local recreation use, and 33,000 in regional parks and open space.

On a regional basis, taking all types of recreation land -- private as well as public -- into account, there appears to be an abundance of land available for recreation purposes. However, the region's recreation land in many cases is poorly distributed, is inaccessible for wide public use, or is inadequately developed.

Over and above the problems implied by the present relationship of recreation space to present population numbers and distribution, there is the equally important question of serving the future needs of a substantially larger, more affluent, and probably more decentralized population. Whatever the nature of the existing gap between available recreation space and the region's present population, the unfilled need is likely to widen rather than diminish in the future. According to one estimate, to meet the requirements forecast for the latter part of the 1970's the capacity of accommodations for

public outdoor recreation in state parks, forests, and reservations would have to be increased by a factor of four between 1957 and 1977, in addition to the need for substantial increase in public ocean beaches.¹

The real recreation area problem confronting the Boston Metropolitan Region lies on the horizon: unless prior action is taken, within thirty to forty years much of the region will be fully developed, primarily in the form of a dispersed pattern of single family detached dwellings. At the same time, the region's wealthier, more mobile population may expand by as much as a million and a half persons, generating an enormous increase in the demand for recreation space. Faced with roughly the same prospect, the New York Regional Plan Association recommended a trebling of permanent open space acreage by 1985, including a fourfold increase in public parks and recreation areas.²

Local and region-wide surveys suggest that additional park and beach acreage and other types of recreation facilities should be created at once. In this connection, the Metropolitan District Commission, local planning boards, and recreation commissions for various communities in the region have consistently recommended increased public acquisition of land for reservation or park purposes.

-
1. Edwards, Kelcey and Beck, An Inventory and Plan for Development of the Natural Resources of the Commonwealth, Part II: Public Outdoor Recreation, (Boston; June, 1957). Prepared for the Commonwealth of Massachusetts, Department of Natural Resources.
 2. Regional Planning Association, The Race for Open Space; Bulletin No. 96, (New York; September, 1960).

An interesting suggestion to meet further needs for regional open space, first made some years ago, is the proposed creation of a green belt about 30 miles from the center of the region, in the general area between Route 128 and Route 495.¹ The location of major existing public open space areas and the proposed arc of open land, the Bay Circuit, is indicated in Figure 10.

1. Edwards, Kelcey and Beck, Op. Cit., (June, 1957).

NEW HAMPSHIRE

MASSACHUSETTS









MAJOR PUBLIC OPEN AREAS

 EXISTING REGIONAL PARKS AND FORESTS

 PROPOSED BAY CIRCUIT

SOURCE: GBESC LAND USE SURVEY

GENERAL INFORMATION

-  EXPRESSWAYS
-  UNDER CONSTRUCTION
-  PROPOSED
-  MAJOR HIGHWAYS
-  SECONDARY HIGHWAYS
-  MAJOR RAILROADS
-  SECONDARY RAILROADS
-  RAPID TRANSIT LINES



0 5 10 MILES

THE PREPARATION OF THIS MAP HAS BEEN FINANCED IN PART THROUGH AN URBAN PLANNING ASSISTANCE GRANT FROM THE U.S. HOUSING AND HOME FINANCE AGENCY UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED.

In the preceding sections of this report, the historic spread of urban development has been described, together with the existing pattern of land use that has resulted from it. The complex characteristics of regional land use do not lend themselves to any simple abstraction. Rather, the pattern reflects the intricate nature of the multitude of inter-relationships between people, land, transport, and other features that are the basis of urban society.

To date, no major effort has been made to formulate a development plan to direct the future growth of the Boston Metropolitan Region, although many of the 144 separate municipalities within the region have prepared such plans for their own jurisdictions. The proposed integrated transportation and planning study of the Boston region that is to be undertaken by the Mass Transportation Commission will be the first such effort on a regional basis. It will also include the assembly of far more information on land use and transportation conditions and patterns than has ever been available for the Boston area.

In the following paragraphs, an effort is made to indicate some of the major factors that will influence the future development pattern of the region and to establish general limits on the nature of the land use changes that can be anticipated through the year 2000, barring unforeseen and drastic changes of the sort that could be caused by war or other catastrophe, or by radical changes in technology.

The Consumption of Regional Land

A major consideration in land use trends is the rate of conversion of open land into urban uses, especially with the growing suburban orientation to new urban development. This extension of development into rural areas has involved substantial increases in land used for industrial and commercial purposes as well as residential land uses.

The Core, with very little open land, is of secondary importance in shaping future regional land use development patterns. Redevelopment rather than new development is of critical importance in the Core, and as a rule, redevelopment introduces only limited changes in the regional land use picture, although it may have substantial effects on economic, social, and transportation patterns. Redevelopment is more likely to change the quality and intensity of land use, as for example, in the Charles River Park urban renewal area which has altered a high density, low-rent residential area to a slightly lower density, high-rent residential area. Because of the high price of in-town land, relatively small acreages are involved in redevelopment projects so that the land use changes which do occur are usually restricted. For example, the entire Government Center Project in downtown Boston involves less than 100 acres.

The key to estimating regional development trends in land use is the rate of open land utilization and the nature of development in suburban and outlying areas. Unfortunately, reliable statistical benchmarks for earlier periods are lacking. This has made it necessary to develop broad, and admittedly crude, estimates based on construction, employment, and population changes and zoning patterns.

One of the most significant trends in the region has been a thinning out of Core population density with an accompanying increase in suburban residential densities. In this process land has been utilized lavishly: on a per capita basis urban development in the inner suburbs uses three times as much land as in the Core area and in the outer suburbs it normally utilizes almost six times as much.

How fast is open land being converted to urban use in the region? It is probable that the 100,000 new dwelling units constructed in suburban and outlying communities of the Boston region between 1950 and 1960

required on the order of 40,000 to 50,000 acres, allowing for streets, schools, and ancillary public and private facilities.¹ If land used for commercial, industrial, institutional, and highway purposes is included, a total of perhaps 50,000 to 60,000 acres of open land may have been converted to urban use during the 1950-1960 decade. Extrapolating 1940-1960 population trends, it appears probable that the Boston Metropolitan Region will experience a population increase of about 1.5 million persons in the 1960-2000 period. On the assumption that 1950-1960 land consumption patterns will continue throughout the 40-year period, it can be tentatively estimated that a minimum of about 50,000 acres of open land will be converted to urban use per decade. At this pace, by the year 2000 about 200,000 acres of open land will be developed out of the total of 800,000 acres of open land in the GBESC study area that were tentatively classified as suitable for development as of 1960. Naturally, this projection would have to be revised if population trends varied from the 1940-1960 pattern or if housing tastes shifted toward proportionately greater amounts of multi-family construction.

Based on this rate of land consumption, the region as a whole is not likely to experience a serious land shortage, but by the end of the 1970's open sites may be scarce in the inner suburbs and the outer cities. In contrast, the outer suburbs will not run out of readily developable sites, at least until well into the next century, since they possess enormous quantities of open land.

-
1. This estimate is based on GBESC findings that the number of acres of residential land per 1,000 persons averaged 90 in the inner suburbs and 165 in the outer suburbs. An average of 120 acres/1,000 population and about 3.5 persons per new dwelling unit would result in an estimated 42,000 acres that would be utilized for residential purposes for 100,000 new dwellings.

To a considerable degree, the region's vacant and rural acreage can be considered a land reserve which can be drawn against when necessary. By far the greater part of this open land appears readily developable since an estimated 80% of the open land has less than a 15% slope and is well drained, according to a GBESC analysis. There is a marked tendency for developers to direct their attention to open rural land, which is usually relatively cheap, rather than to confine themselves to land zoned for urban development. This is one of the reasons for the growing emphasis in many areas on conservation and land acquisition programs aimed at reserving open land for public use.

The Role of Agriculture

Farming plays a rapidly diminishing role in the regional land use pattern. In 1960 less than a sixth of the region (fewer than 200,000 acres) was used for farming as compared to a quarter of regional acreage ten years earlier. Under the pressures of urbanization, the increasing competition in major segments of the region's agriculture, and the lure of better paying urban jobs, Census reports indicate that the amount of land devoted to agriculture in the region has decreased at the rate of about 25% per decade since 1940. The cost-price squeeze in agriculture, together with the prospects of a higher return on land near urban areas for non-agricultural use, often leads to the sale of farm land for urban purposes. However, assisted by importation of low cost feed grains, a high degree of skill or capital inputs from non-farm sources, some urban farmers have continued to flourish. These are in the minority: abandonment of farming well in advance of actual alternative use and the return of cultivated land to untended forest is one of the major trends throughout much of the urbanized eastern seaboard. 1

-
1. A penetrating discussion of trends in agricultural and forest land use is found in: Gottman, Jean: Megalopolis, (The Twentieth Century Fund, New York, 1961).

The Effect of Zoning

To the extent that present zoning represents a commitment to a particular land use pattern, future urban development in the Boston region may assume much the same form as in 1960. Figure 11 compares the proportions of open, zoned land in the region with land devoted to major urban uses and reveals that the combined zoning decisions of the 144 cities and towns seems to point to essentially a continuation of the 1960 pattern of land use. Only with respect to multi-family use does the present zoning depart from the present land use pattern; proportionately, only an eighth as much open land is zoned for multi-family use as is currently utilized for this purpose. To a smaller degree, zoning for commercial purposes also is a less significant factor than is commercial use in the existing land use pattern.

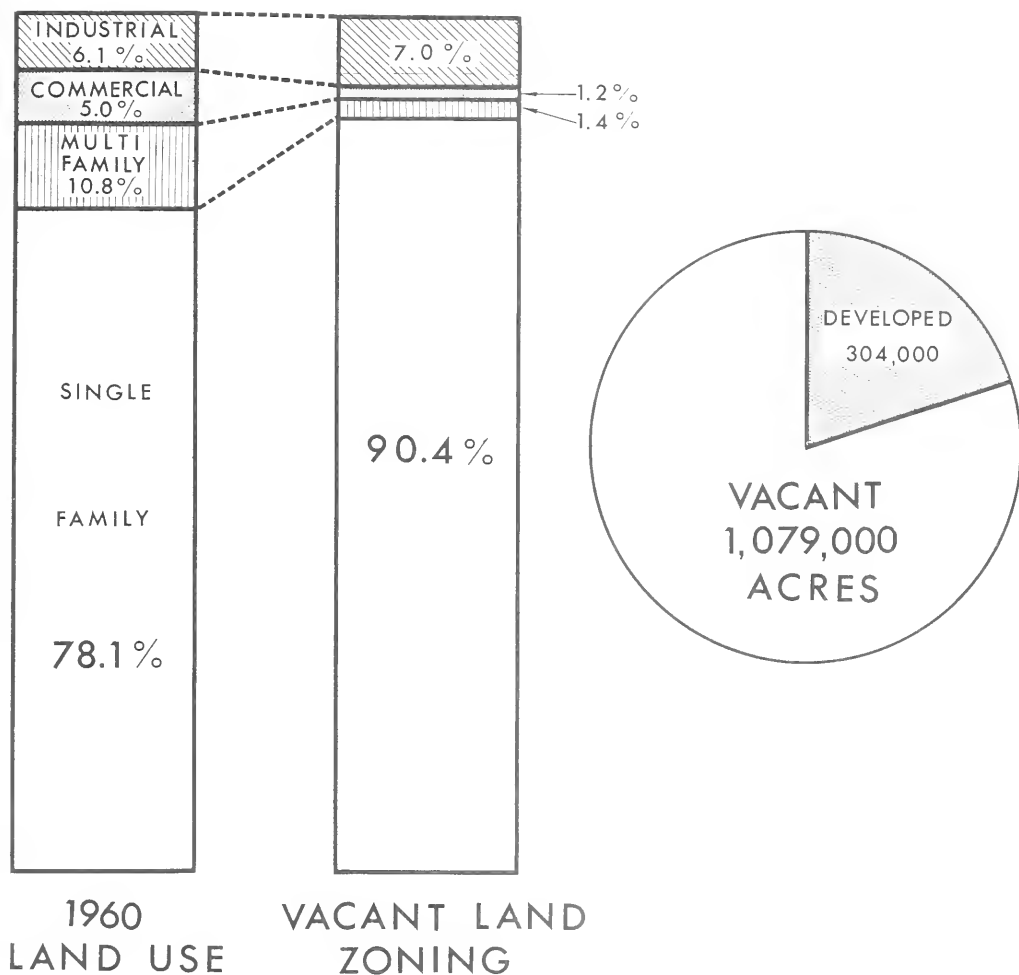
Experience abundantly proves that zoning maps are not always an accurate presentation of a town's intended land use distribution. Greater Boston municipalities have tended to zone large areas of undeveloped land for two principal uses: single family and industrial. A potential under-zoning for multi-family housing (and possibly over-zoning for single family use) in the present pattern may be indicated by the fact that whereas in 1960 approximately 15 acres were used for single family dwellings for every acre used for multi-family units, there are 60 areas zoned for single-family use for every acre zoned for multi-family dwelling. It is not clear to what extent this change in ratios reflects a change in housing markets and to what extent it is indicative of suburban distaste for apartment houses.

With the possible exception of multi-family zoning, the region would appear to have an ample supply of zoned land to meet all of its needs in the next four or five decades. Current zoning, even making allowances for site unsuitability, would theoretically permit a very

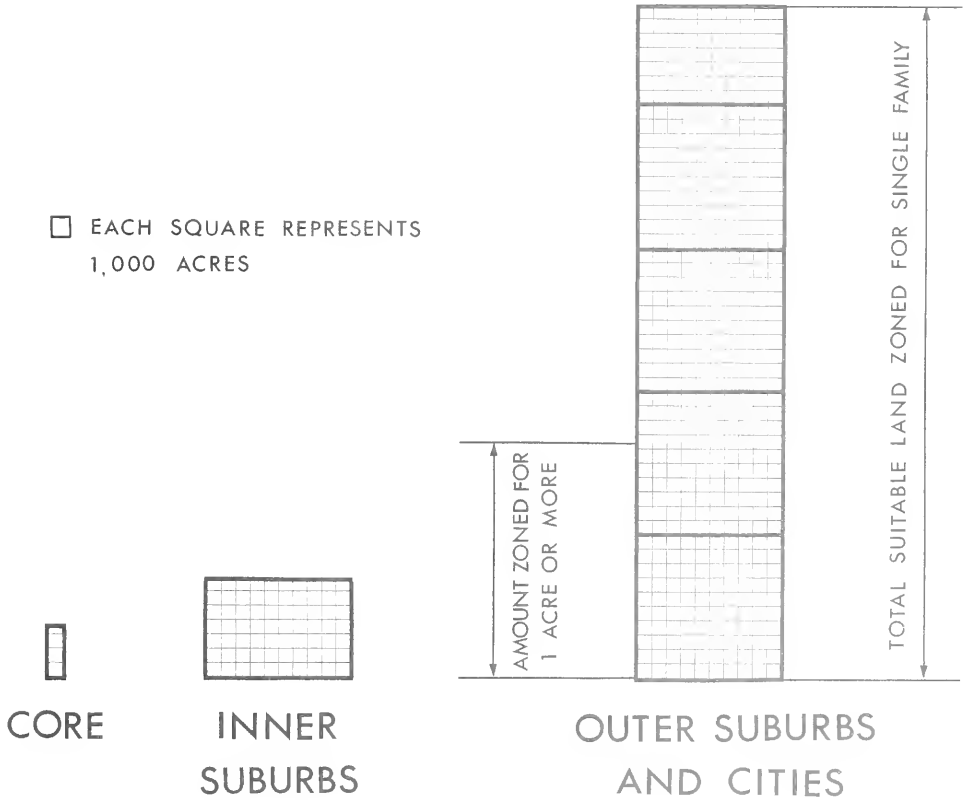
great increase in all types of development. For example, if all zoned land were fully used, available sites could support twice the 1960 population and four times 1960 industrial employment. It must be recognized, however, that the region-wide abundance of open land zoned for various purposes conceals a number of localized shortages. Aside from the probable insufficiency of multi-family zoning in suburban areas, suitably zoned land is in short supply in a number of communities. In some suburban towns large lot zoning is the chief reason for the shortage of reasonably priced residential land while in the Core communities land speculation and problems of land assembly into usable parcels may be responsible.

Data on the prevalence of large lot zoning has been compiled by the Greater Boston Economic Study Committee. In the GBESC study area, as of 1960, 180,000 acres of the approximately 700,000 acres of open land zoned for single family residential use and considered readily developable, was zoned for lots of one acre or larger. Zoning for lots of one acre or more accounts for over a third of the buildable residential land in the outer suburbs and a quarter of the remaining readily developable land zoned for single family use in the inner suburbs. The distribution of large lot acreage is shown in Figure 12. Even in the site-poor Core, a significant percentage of the remaining open acreage is zoned for large lots.

Little of the acreage in the region, even in the outer suburbs, is zoned for lots much larger than one acre. This, however, is subject to change; one of the major trends in regional land development is the increase in minimum acreage requirements for single family dwellings as more and more communities seek to escape an influx of low cost houses which could result in higher taxes for the present residents. A continuation of the long term trend toward large lot sizes can be anticipated as more and more communities attempt to zone out large scale, low-cost housing.



LAND USE AND ZONING 1960, GBESC AREA



LARGE LOT ZONING OF SUITABLE LAND, 1960

ZONING OF OPEN LAND IN SUB-AREAS OF THE GBESC STUDY AREA, 1960

Land	Acres in Thousands				Total Area
	Core	Inner Suburbs	Outer Suburbs	Outer Cities	
Zoning					
Single-family	3.4	97.3	853.1	21.4	975.3
Multi-family	1.2	00.7	13.0	0.3	15.2
Commercial	0.3	2.3	9.3	1.2	13.1
Industrial	1.7	15.7	55.9	2.4	75.6
Total Open Land	6.5	116.0	931.4	25.2	1,079.2
Per Cent of Total Land	8.1%	45.6%	79.5%	53.2%	69.4%
Character of Land					
Swampy	1.3	26.2	189.1	2.6	221.2
Slope of 15% or More	0.3	10.7	42.8	0.5	56.1
Suitable for Development	4.9	79.1	699.5	22.1	801.8

Source: GBESC, Land Use in Greater Boston in 1960, Land Use Report No. 1, (May, 1961).

All indications are that housing patterns in the next twenty years will not differ greatly from those of the 1950-1960 period. The bulk of the region's new housing will continue to be single family, detached units, although some increase in the proportion of multi-family dwellings appears probable. New residential construction is not likely to create an insuperable drain on the region's open land supply but land shortages in close-in suburbs, created partly by large lot zoning, will probably lead to additional emphasis on developing tracts in outer suburban communities. The 1960-1970 and 1970-1980 decades may therefore see extremely rapid housing expansion in the outer suburbs coupled with a deceleration of growth in the inner suburbs and a relatively modest amount of residential construction in the Core.

Shortages of industrial and commercial land also appear unlikely, except perhaps for prime sites in the most desirable locations. The GBESC industrial land study found only one sub-region of Greater Boston in which the amount of open, suitable land now zoned for industry was only equal to the industrial land expected to be needed in the next two decades. This was the Route 128 Band. In all other sub-regions there was a sizable surplus of open, zoned land, ranging up to 26 acres available to one of projected need in the Brockton-Taunton area. Even the Core apparently contains adequate amounts of open industrial land to support considerable growth in industrial use.

Future Patterns of Growth

Barring major action to alter the pattern of regional growth, the future directions of development of the Boston Metropolitan Region appear likely to resemble those of the recent past. These broad directions are not readily subject to deliberate change. They are the result both of long-standing trends and economic pressures. Actions by local government, such as are represented in the adoption of local

zoning by-laws, appear more likely to encourage and accommodate than oppose these directions. This does not mean that the pattern of urban development in the region cannot be altered. Actions that are well within the power of local and state government can directly influence the pace and pattern of urban development. These actions include zoning, the provision (or refusal to provide) basic urban services such as water, sewerage, drainage, or schools, and the amounts and types of transportation facilities that are constructed.

The extent to which each of the elements of the regional transportation system can be expected to influence future land use patterns will be examined in subsequent reports in the Boston Regional Survey. In addition, the forthcoming comprehensive regional development plan can be expected to provide detailed insights into the nature of the relationship between transportation and land use in the Boston region. It is anticipated that out of this effort will come clear guide lines for regional development.

The Greater Boston Economic Study Committee has published (May, 1962) a land use survey for the Greater Boston area. Land Use in Greater Boston in 1960. This is a pioneer survey of the region and is the major source of the land use data in this report. The data was collected from numerous local studies, supplemented by field surveys for communities lacking recent surveys. Although for most of the region the information is for the year 1960, for some municipalities the data ranges from 1955 to 1961. The land use classification is divided into eight major categories: Residential, Commercial, Industrial, Public Utilities, Institutional, Recreational, Vacant and Agricultural, and Public Land.

Industrial Land Needs of Greater Boston, Through 1980, 'Land Use Report No. 2, prepared by The Planning Services Group for GBESC (May, 1962), contains projections of employment and employment density ratios in manufacturing and wholesale industry and projections of future industrial land needs by sub-areas of the Boston region. The report includes an analysis of the implications of these projections for industrial development in the region.

Development Trends in the Central Merrimack Valley, prepared by The Planning Services Group for the Central Merrimack Valley Planning District (May, 1961), provides an overview of the land use patterns in a four-community area in addition an analysis of population and economic trends. Land for Industry in the Central Merrimack Valley, another report in the same series, (October, 1961), evaluates the adequacy of land zoned for industry and ranks each of the major potential industrial sites of the area in terms of its value for industrial use.

Land use surveys have been prepared for a large number of individual cities and towns in the Boston Metropolitan Region. These were utilized, in most instances, as the basis for the GBESC regional land use map. Listings of the planning studies prepared by regional cities and towns (almost all of which include a land use survey) are contained in A Bibliography of Planning Studies in the Boston Metropolitan Region, an earlier publication in the Boston Regional Survey.

Recreation Facilities of the Metropolitan District Commission, prepared by James F. Whalen for the Metropolitan District Commission, lists and briefly describes all facilities of the M.D.C.

The United States Department of Commerce in the 1960 Census of Housing presents detailed data on the condition, type, cost, and many other characteristics of housing units in metropolitan areas and selected communities. Also useful is the Census of Agriculture, the most recent version of which is as of 1958. This presents data on agricultural uses of land.

The Department of Labor and Industries of the Commonwealth of Massachusetts, in cooperation with the United States Department of Commerce, compiles an annual Summary of Building Permit Activity. This information makes it possible to identify the location, size, and cost of new dwelling units.

The Department of Natural Resources of the Commonwealth of Massachusetts has published An Inventory and Plan for Development of the Natural Resources of Massachusetts, prepared by Edwards, Kelcey and Beck, in 1957. Part One of this study presents an inventory and evaluation of the condition of the major natural resources of the Commonwealth including forests, water, ocean beaches, inland beaches, minerals, wildlife, and related resources. The second part deals with Public

Outdoor Recreation. This section lists existing recreation areas in Massachusetts and presents an analysis of the current and projected needs for such facilities.

Information concerning certain aspects of commercial land use is presented in a map and accompanying booklet published by The Boston Globe, (Shopping Centers and Shopping Districts in the Boston Market, April, 1962).

LAND USE

LIST OF CORRECTIONS

Map No.

Correction

4

Framingham should be 25 - 54.5%:

Rockport should be Over 55%:

Stoughton should be 25 - 54.5%



7582

